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10/574,567

03/29/2007

Chikara Ohki

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SUITE 800

WASHINGTON, DC 20006-1021

EXAMINER

VELASQUEZ, VANESSA T

ART UNIT

PAPER NUMBER

1793

MAIL DATE

DELIVERY MODE

10/01/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

| | | | |
|------------------------------|--------------------------------------|------------------------------------|--|
| Office Action Summary | Application No. 10/574,567 | Applicant(s) OHKI ET AL. | |
| | Examiner Vanessa Velasquez | Art Unit 1793 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 April 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 04 April 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>Mar. 29, 2007</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Status of Claims

Claims 1-4 are presented for examination on the merits.

Priority

Acknowledgment is made of applicant's claim for foreign priority under 35 U.S.C. 119(a)-(d). The certified copy of JP 2003-352998 has been received.

Information Disclosure Statement

One (1) information disclosure statement (IDS) was received on March 29, 2007. The submission is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

Specification

The abstract is objected to because of a typographical error. In the abstract (page 32, lines 1-2), the phrase "alloyed with" is repeated twice in succession. Appropriate correction is required.

Claim Rejections - 35 USC § 112, Second Paragraph

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

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2. Claims 1-4 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 1, the claim recites a grain size number but does not specify the standard used (e.g., ASTM, JIS, etc.). Applicant is asked either to specify the standard or to provide a numerical value (e.g., diameter, length, etc.) for the dimension. If a standard is specified, a copy of the standard as taught in a handbook or reference book should be provided. Claims 2-4 are likewise rejected for depending upon a rejected claim.

Regarding claim 4, the claim is ambiguous because it is unclear which member is the bearing ring.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.

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4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).
6. Claims 1-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ohki (US 2003/0123769 A1) in view of Maeda et al. (JP 2002-115031, machine translation).

Regarding claim 1, Ohki teaches a steel composition, in percent by weight, comprising the following elements (para. [0024], [0025], [0055]):

| Element | Claim 1 | Ohki et al. |
|-----------------|------------|-------------|
| C | 0.6 - 1.3 | 0.6 - 1.2 |
| Si | 0.3 - 3.0 | 0.15 - 1.1 |
| Mn | 0.2 - 1.5 | 0.3 - 1.5 |
| P | 0 - 0.03 | 0 - 0.1 |
| S | 0 - 0.03 | 0 - 0.1 |
| Cr | 0.3 - 5.0 | 0 - 2.0 |
| Ni | 0.1 - 3.0 | silent |
| Al | 0 - 0.050 | 0 - 0.1 |
| Ti | 0 - 0.003 | silent |
| O | 0 - 0.0015 | 0 - 0.1 |
| N | 0 - 0.015 | 0 - 0.1 |
| Fe + impurities | balance | balance |

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Ohki is silent as to the titanium content. However, titanium is expected to either be absent or present only in negligible amounts, as it is stated that the balance of the composition is iron and that the amounts of other impurities do not exceed 0.1 wt.% (para. [0024]). Therefore, titanium would be expected to be present in an amount not exceeding 0.1 wt.%. The overlap between the ranges taught in the prior art and the claimed ranges is sufficient to establish a *prima facie* case of obviousness (MPEP § 2144.05 Section I).

Still regarding claim 1, the microstructure of the steel is austenitic with grains having a JIS grain size number higher than 10 (para. [0031]). A roller bearing comprising an outer ring, inner ring, and rolling elements may be formed from the steel composition taught above (para. [0053]).

Still regarding claim 1, the heat treatment to which the steel of Ohki is subjected produces nitrides in the surface layer due to a final quenching step (para. [0011]), thereby producing a surface saturated with nitrogen.

Still regarding claim 1, Ohki does not teach steel containing nickel. Maeda et al., also drawn to a roller bearing comprising a composition that overlaps that of Ohki, teaches that nickel is added in amount ranging from 0.1% to 3.0% in order to enhance fatigue resistance and prevent surface degradation at elevated temperatures (para. [0010]). Therefore, it would have been obvious to one of ordinary skill in the art to add nickel to the steel of Ohki because nickel improves the surface properties and fatigue resistance of Fe-Si-Mn-Cr steels, as taught by Maeda et al.

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Regarding claim 2, Ohki is silent as to the vanadium and molybdenum content. Maeda et al. teach that the addition of vanadium and molybdenum (0.05-1.0%, 0.05 to less than 0.25, respectively) controls the softening of steel at elevated temperatures (para. [0015]-[0016]). Vanadium and molybdenum further act like nickel in that they enhance fatigue resistance and prevent surface degradation at elevated temperatures (para. [0015]-[0016]). Therefore, it would have been obvious to one of ordinary skill in the art to add vanadium and molybdenum to the steel of Ohki because they improve the surface properties and fatigue resistance of Fe-Si-Mn-Cr steels, as taught by Maeda et al.

Regarding claims 3 and 4, Ohki in view of Maeda et al. do not explicitly teach a nitrogen-enriched layer having a content of 0.1% to 0.7% or that said content is measured at a depth of 50 microns. However, the carbonitriding process taught by Ohki (FIG. 2) appears to be identical to that disclosed in the instant specification (see FIG. 2 of the instant application). It has been established that "[w]here the claimed and prior art products are identical or substantially identical in structure or composition, or are produced by identical or substantially identical processes, a *prima facie* case of either anticipation or obviousness has been established" (emphasis added, MPEP § 2112.01 Section I). In the instant case, the carbonitriding processes disclosed by Applicant appear to be substantially identical to that of Ohki. Therefore, the composition of the nitrogen-enriched layer, including the depth at which it is measured, would be expected to be substantially identical to that of the claimed invention.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Vanessa Velasquez whose telephone number is (571)270-3587. The examiner can normally be reached on Monday-Friday 8:30 AM-6:00 PM ET.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King, can be reached at 571-272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Roy King/
Supervisory Patent Examiner, Art
Unit 1793

/Vanessa Velasquez/
Examiner, Art Unit 1793

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